Energy



DHW Systems in Multi-family Buildings

Importance of DHW in Achieving ZNE Goals

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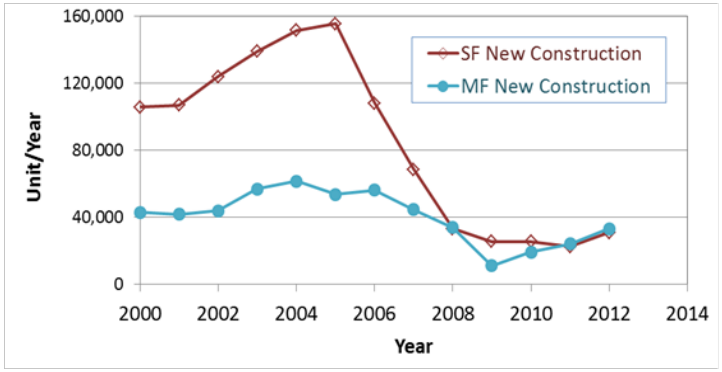
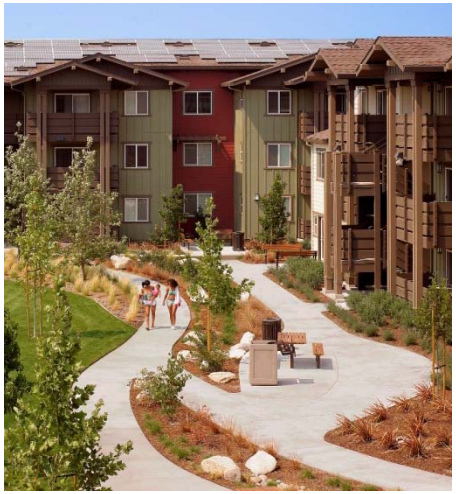
July 16, 2013

1. Formerly HMG (Heschong Mahone Group). Acquired by TRC 1/1/2013

Buildings

- Multi-family (MF) Buildings
  - Low-rise, high-rise, & mixed use
  - Steady growth in recent years

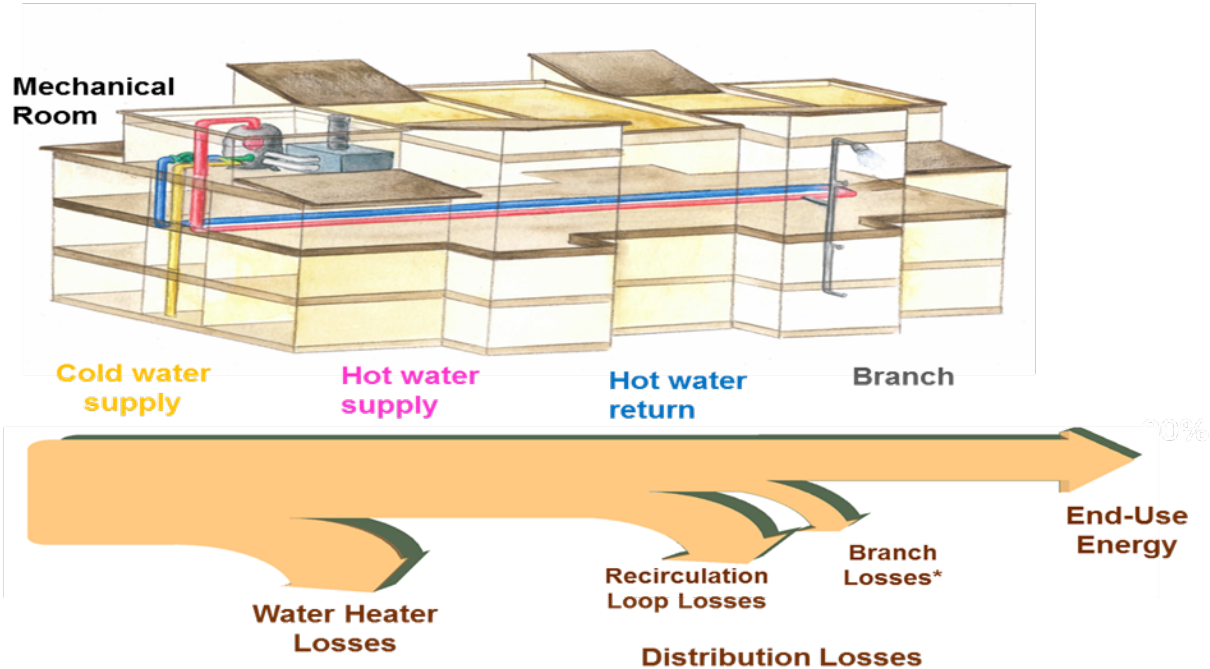




- Hotel/Motel
  - DHW systems similar to those in MF buildings
  - Also serving on-site restaurants
  - 5% of nonresidential new construction

DHW System Designs

- Central DHW System – the Most Popular Design



Average System Efficiency: 33%

Other Related Systems

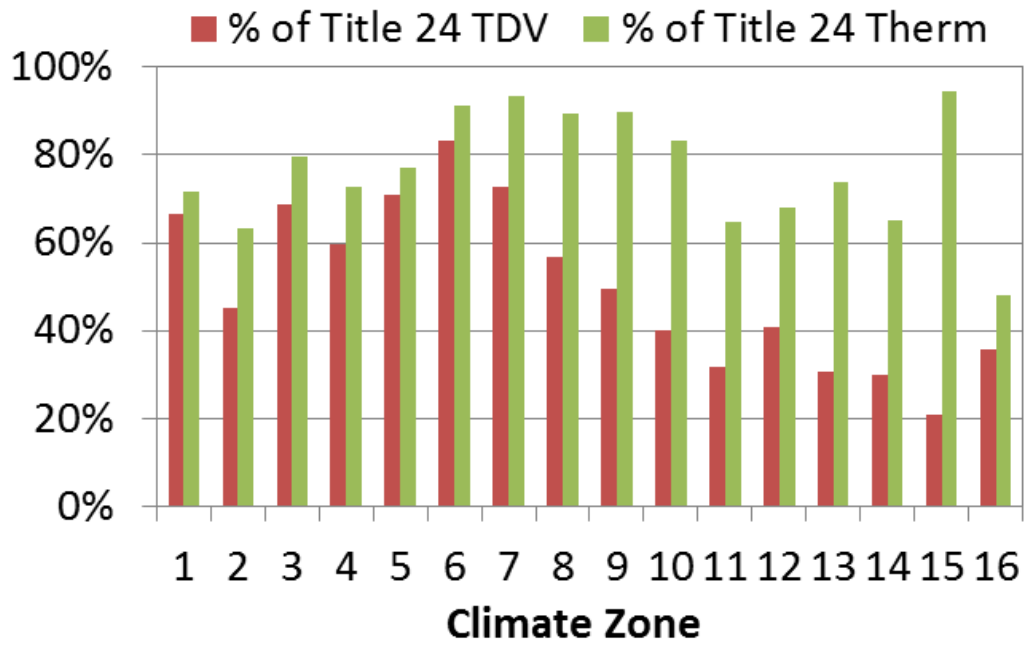
- Heating Systems
  - Space heating
  - Pool heating

  } Can share heating equipment and/or distribution systems with the DHW system

- AC/Refrigeration Systems:
  - Condenser heat recovery
- Water Drain System:
  - Heat recovery

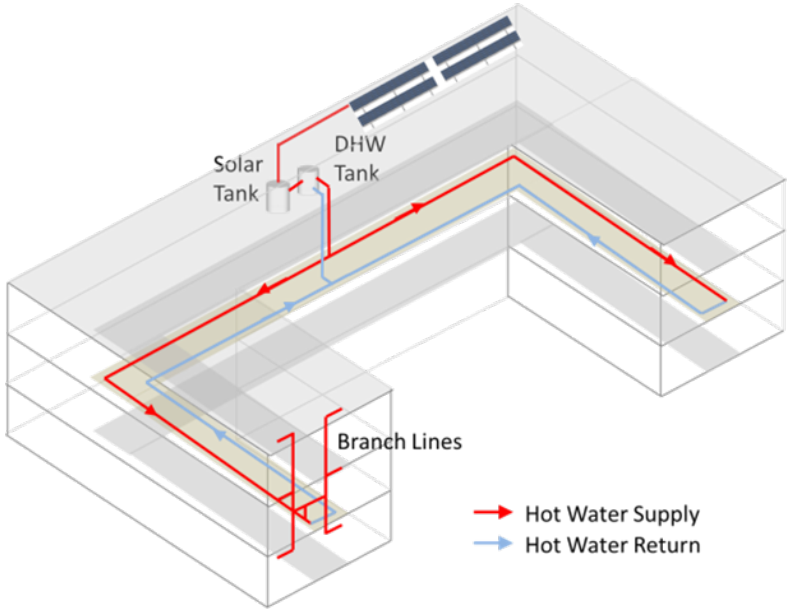
DHW Energy Use in MF Buildings

- Critical to ZNE Goals
  - Based on either TDV (Time Dependent Value) or Therm



Current MF DHW Title 24 Requirements

- Water Heating Equipment
  - Standard-efficiency gas water heater
  - Solar water heater
- Distribution System
  - Dual-loop design
  - Demand recirculation
- Prescriptive Requirements
  - Can be traded off
- ACM Plumbing Design Check



Improvement Strategies

- Current Design Practice
  - Heating Equipment
    - High-efficiency water heaters/boilers
    - Better solar WH performance requirements
  - Distribution System
    - Optimization of distribution piping
    - Recirculation control improvement
- Advanced System Designs
  - Distribution systems without large recirc. heat loss
  - Integration with space heating
  - Better integration with solar WH and PV
  - Accommodating heat recovery systems
  - Water efficiency considerations

Title 24 - Focus on Integrated Designs

- Demonstrate New Systems Designs
- Collect Performance Data
- Establish New Performance Rating Methods
- Develop Title 24 Performance Modeling Methods
- Implement code changes steadily and gradually to migrate toward high-efficiency system designs

Thank you

Questions?

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